

**IN THE CLAIMS:**

Please amend the claims as follows:

1. **(Currently Amended)** A method for producing a membrane-electrode structure, comprising the steps of:

applying ~~on a sheet substrate~~ a catalyst paste onto a sheet substrate,  
wherein the catalyst paste comprises comprising an electron conducting material supporting a catalyst and an ion conducting material; and

drying the catalyst paste same, so as to form [[a]] an electrode catalyst layer;

thermally transferring said electrode catalyst layer onto each side of a polymer electrolyte membrane, ~~so as to form a laminated body, wherein such that~~ said electrode catalyst layer is connected to each side of said polymer electrolyte membrane;

applying ~~on a carbon substrate layer~~ a first slurry onto a carbon substrate layer, wherein the first slurry comprises comprising a water-repellent material and an electron conducting material; and

drying the first slurry same to form a water-repellent layer; and then

applying ~~on said water repellent layer~~ a second slurry onto said water repellent layer, wherein the second slurry comprises comprising an electron conducting material and an ion conducting material; and

drying the second slurry same to form a hydrophilic layer, ~~so as to form wherein~~ a diffusion electrode consisting of said carbon substrate, said water-repellent layer and said hydrophilic layer is formed; and

~~laminating the previously formed~~ positioning said diffusion electrode on said electrode catalyst layer of said laminated body ~~through~~ via said hydrophilic layer; and [[.]])

pressing said laminated body and said diffusion electrode together the two under heating, ~~so as~~ to integrate said laminated body and said diffusion electrode.

2. (Original) The method for producing a membrane-electrode structure according to claim 1, wherein said second slurry comprises a pore-forming material.

3. (Original) The method for producing a membrane-electrode structure according to claim 1, wherein said catalyst paste comprises a pore-forming material.

4. (Currently Amended) The method for producing a membrane-electrode structure according to claim 1, wherein each of said catalyst paste and said second slurry comprises a pore-forming material, and wherein said hydrophilic layer and said electrode catalyst layer are formed using a such that the ratio of the a volume of pores with a pore size of 0.01 to 1  $\mu\text{m}$  formed in said electrode catalyst layer by said pore-forming material to the a volume of pores with a pore size of 0.01 to 1  $\mu\text{m}$  formed in said hydrophilic layer by said pore-forming material that is less than 1.0.

5. (Currently Amended) The method for producing a membrane-electrode structure according to claim 1, wherein said hydrophilic layer and said electrode catalyst layer are formed using a such that the ratio of the a weight of

~~an said ion conducting material contained in said electrode catalyst layer to the a weight of an said ion conducting material contained in said hydrophilic layer that~~ is set within the a range of 1.0 to 1.4.

6. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 1, wherein said hydrophilic layer and said electrode catalyst layer are formed ~~using a such that the ratio of the a weight of solid content in said electrode catalyst layer to the a weight of solid content in said hydrophilic layer that~~ is set within the a range of 1.0 to 3.5.

7. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 1, ~~which comprises applying said second slurry on said water repellent layer and drying the same, so as to form a wherein said hydrophilic layer has a having the maximum height of surface roughness, Rmax, of 40 μm or less.~~

8. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 7, wherein said hydrophilic layer is formed ~~such that it has a surface roughness in which the ratio of the a surface area to the a unit area that~~ is 1.25 or less.

9. **(Currently Amended)** The method for producing a membrane-electrode structure according to claim 7, wherein ~~said water repellent layer and said hydrophilic layer are formed such that the a differential pressure between one side of said diffusion electrode and the other side thereof is set within the a range between 100 and 300 mmAq, when the air is supplied at a flow rate of 0.5 L/cm<sup>2</sup>/min in the a direction of a the thickness of said diffusion electrode.~~

10. (**Currently Amended**) The method for producing a membrane-electrode structure according to claim 1, wherein said polymer electrolyte membrane is formed from a sulfonated polyarylene based polymer solution, and when said catalyst paste comprises catalyst particles consisting of a catalyst supported by carbon particles, an organic solvent solution containing a perfluoroalkylene sulfonic acid polymer, and a pore-forming material,

said electrode catalyst layer is dried ~~to such an extent that the~~ wherein a content of the solvent becomes 20% or less by weight based on the a total weight of said electrode catalyst layer, and the dried electrode catalyst layer is then thermally transferred onto and connected to said polymer electrolyte membrane.

11. (**Currently Amended**) The method for producing a membrane-electrode structure according to claim 10, wherein ~~said thermal transfer is carried out~~ the dried electrode catalyst layer is thermally transferred onto and connected to said polymer electrolyte membrane under a pressure within the a range of 1 to 5 MPa.

12. (**Currently Amended**) The method for producing a membrane-electrode structure according to claim 10, wherein said catalyst paste is applied on a surface of ~~said sheet substrate whose surface has~~ having a contact angle to water of 55° to 105°.

13. (**Currently Amended**) The method for producing a membrane-electrode structure according to claim 10, wherein when said diffusion electrode is laminated placed on each electrode catalyst layer and ~~they are~~ then pressed

under heating, the and wherein said diffusion electrode and said laminated body  
are pressured under an applied pressure is set within the a range of 0.5 to 4  
MPa.

Claims 14-16 (**Cancelled**).

17. **(New)** The method for producing a membrane-electrode structure according to claim 1, wherein the membrane-electrode assembly is incorporated in a polymer electrolyte fuel cell.